

City of San Antonio, Texas
Development Services Department
Tree Identification in the Field

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Texas has 10 Vegetational Areas which allows for a great diversity of trees. These areas differ primarily by the amount of rainfall it receives and the soil type and include forests, prairies, savannahs and mountains.



In order to begin the discussion on tree identification, a definition is given. A tree is defined as a woody plant with a well-developed crown, typically has a single trunk with a height at maturity of at least ten feet tall with the capability of having a six inch diameter trunk. This definition would include many of the “small tree” species that are often overlooked in a tree survey.

Trees are in two major groups. One group is that which has a “naked” seed surrounded by a scale (cone). This group is the Gymnosperms (*gym* meaning naked) that include the pines, junipers and cedars. Another term for this group is **Conifer** and can be used on a tree survey if the exact

species is not known. Conifers have leaves that are either a needle (pines) or a scale (juniper and cedar) and they are evergreen, keeping their leaves on year round.

The other group includes those that have their seed surrounded by some type of fruit (ovary); dry or fleshy. This group, Angiosperm is the largest group of trees in Texas. Another term for this group is **Broadleaf**. Most Broadleaf trees are deciduous, losing their leaves in the fall and producing all new ones in the spring. There are a several Broadleaf trees that are considered “evergreens” including the Southern Magnolia, American Holly and the Live Oak. Actually, the Southern Magnolia will replace its leaves every two years and the Live Oak every year (March).

There are specific characteristics that are used for tree identification. These are called diagnostic features. Unfortunately, which characteristic is best, varies with the tree species or tree type. To understand what differences to look for on a plant, here is an introduction to some of the terms.

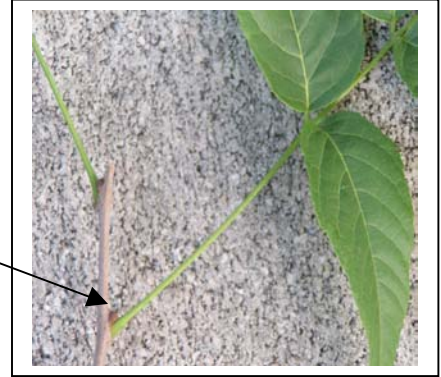
- Leaf – made of the leaf blade (thin, expanded organ, usually green growing from the stem of a plant) and the petiole.
- Petiole – stem of a leaf that attaches the leaf to another stem or branch.
- Lobed – indented about $\frac{1}{4}$ to $\frac{1}{2}$ way to the midrib or base of a leaf blade or petal.
- Bud – an undeveloped or dormant leaf or flower, usually enclosed by protective scales.
- Petals – one of the leaf-like parts of the flower.
- Ovary – fruit that contains the seed.
- Species – group of plants or animals that is distinct in shape and reproduction can only be within the group. Every species has 2 names; the first is the Genus and is like a person’s family name and the last name is specific to that type of plant. An example is *Quercus virginiana* the scientific name for the Live Oak. There are many oak species and all of their first names would be *Quercus*. This scientific name is a universal name.
- Common names – are local names used by those in that area and are not universal.

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1. Leaves:

a. Simple or Compound refers to the number of leaflets per leaf.

There is always a bud at the base of the true leaf.



Simple Leaf:

One leaf – such as Rusty Black Haw and Viburnums



Compound Leaf:

Multiple leaflets – such as the Texas Mountain Laurel,
Pinnate Compound



Eve's Necklace
Pinnate Compound



and the Huisache
Bipinnate Compound



Pine Trees are identified not only by their cones, but also by the number of needles within the bundles and the length of the needles.



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b. **Arrangement** refers to how the leaves attach themselves to the stem. The categories are opposite, alternate or whorled.

Opposite Leaves: Vitex



Alternate Leaves: Citrus



Whorled Leaves: Button Bush



c. **Shape** refers to the general outline of the leaf blade and there are many types of shapes; cordate (heart-shaped), orbicular (round) and lanceolate (sword-shaped).

Cordate: Redbud



Lanceolate: Peach



d. **Margins** refer to the edge of the leaf and they are either entire (smooth), lobed or serrated (like a serrated knife).

Smooth – Bay tree



Lobed – White Oaks (the veins do not extend beyond the leaf)



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Lobed – Red oaks (the veins do extend beyond the leaf)

Serrated (like a saw) – Plum or Cherry (similar serration is on all of the members of the Rose family)



2. Twigs:

a. **Arrangement** on a branch. The categories are opposite, alternate or whorled. If the twigs are opposite then the tree must be one of these;

Mexican Silk-tassel
Maple
Ash, Ligustrum
Dogwood
Elderberry, Rusty Blackhaw
Horse Chestnuts, Buckeyes
Vitex

b. Presence of **lenticels** on the stem (light colored breathing pores) – the Plum



c. **Buds** can be used for identification in the winter: hairy, smooth, gummy, etc.



Smooth – Ash

Buds with a hair-like appendage – Mulberry



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d. **Bark** – color, fissures and/or protrusions is also used for identification in the winter.



Smooth gray bark – Texas Persimmon



Diamond shaped bark fissures/extrusions – Mesquite

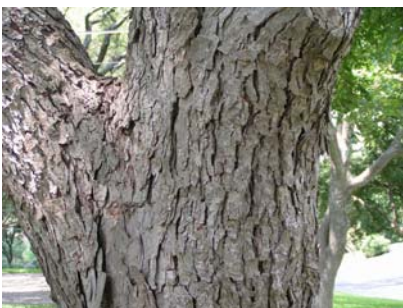


Fused trunks – Anaqua



Thick bark with shallow ridges – Live Oak

Thin shaggy bark – Pecan



Thin bark with deep gray ridges – Cedar Elm



Very thin gray bark with lighter almost white markings – Red Oak

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Cork-like extrusions – Hackberry



Smooth white bark with the outer bark flaking off – Sycamore

3. Flowers are the most reliable way to identify trees, but most of the time they are not present:

Singular flowers are usually conspicuous flowers with
Showy petals – S Magnolia



Flowers in clusters can be with petals – Wild Olive



or without petals – Black Willow which has catkins

Flower spikes – Vitex.



4. Fruits:

Singular or multiple; dry or fleshy.

Singular, fleshy fruit – Plum



Dry fruits with wings – Ash. The Maple also has dry winged fruits.

Legume (contain bean-like fruit):



Flat legumes – such as the
Texas Orchid tree.



Full and rounded legume – such
as the Texas Mountain Laurel

Pod:



The Catalpa and Desert Willow
have similar shaped fruits to a
legume, but they are pods with dry
winged seeds instead of beans.

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5. Shape of the tree canopy

Spreading – Live Oak



Frond-like foliage at the end of each branch – Chinaberry

Crown includes long whip-like branches growing beyond the main canopy – Hackberry



Oval semi-compact canopy – Cedar Elm

Pyramidal shape – Deodar Cedar and Pine trees



Spreading canopy of feathery leafed branches – such as the Huisache

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6. Location:

Typically found on high and dry ground.

Typically found near water, creek or river.

High and dry and ground – such as Junipers, Pines, Southern Red Oak, Huisache, Mesquite, Acacia, Redbud, Ebony.

Creeks and rivers are called riparian trees – such as Willow, Boxelder, Tupelo, River Birch, American Hornbeam, Willow Oak, Dogwood, Crabapple, Bald Cypress.

Many trees can thrive in both locations – such as Pecan, Live Oaks, Elms, Cottonwood, Black Walnut, Bur Oaks, Post Oak, Shumard Oak, Black Jack Oak, Elm, Hackberry, Sycamore, Mulberry, Osage Orange, Magnolia, Sweetgum, Honey Locust, American Holly, Maple, Linden, Ash, Catalpa, Chinaberry, Chinese Tallow.

Use of Trees for Bearings in the Field

Trees can also be separated by their typical life span. Those that are long-lived are ones that have been used traditionally as bearing trees in the field. Long-lived trees and/or those with durable wood, include Red Oaks, Mesquite, Pecan, Live Oaks, Elms, Black Walnut, Osage Orange, Bur Oaks, Post Oak, Elm and Bald Cypress. The short-lived trees such as Hackberry, Boxelder, Ash, Willow Oak, Chinaberry, Chinese Tallow, Cottonwood, Mulberry and Sycamore should not be used as bearing trees or corner markers. If possible, it is recommended to use 3-4 witness trees to mark corners especially on large tracts of land. In the past, these trees were often marked with an X using a hatchet. Marking a tree low on the trunk would insure that if the tree was cut and the stump left, the mark could still be seen and used.

Today, paint is more acceptable to use for marking especially when dealing with oaks. Wounding an oak tree and not painting that wound within 30 minutes can lead to the infection of the tree to the Oak Wilt disease. This disease is spread from oak tree to oak tree by a beetle carrying the fungal spores on its feet. The beetle is attracted to sap from fresh wounds and when it lands on this fresh wound, the Oak Wilt fungal spores are deposited in the wound and begin growing throughout the tree. Trees of the same species, growing together in one location, have their roots growing together. They are actually grafted, sharing food and water. This infected tree will spread the disease to its neighbor trees in this manner, killing large areas of oak trees. This is occurring today in some parts of Texas.

When trees grow, new wood is added around the heart wood. This new wood (cambium) transports food down from the leaves to the roots and water up through the tree and out the leaves as a water vapor (this transpiration is how trees cool the environment like a swamp cooler).

Basically, this wood only lives for one year and then turns into heart wood which is non-living tissue. As a tree is laying down this new wood it can grow around objects such as wire fences. Often this will cause a distortion in the wood/bark of the tree such as with this Huisache, but most often will not be so noticeable. Any type of wound that is made into the tree's cambium will form a scar. Such a tree can be a "block out tree" so that if the tree is cut into the scar or marking can be seen and used to verify points. This scar can also be



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used to determine the amount of time that has passed since the wound/markings occurred. If the growth rings outside of the scar are counted this gives a good approximation of the number of years that have passed since the wounding. Again this information can be used in adverse possession cases.

Tree trunks can also be bored with an incremental auger. It is possible to determine an approximate age of a tree in this way by counting the rings. This method of ring counting is much less accurate the further west one goes in Texas. In the semi-arid and arid regions, inconsistent rain can lead to more erratic annual ring production as more than one or no ring may be produced in some years. Trees that are in high rainfall parts of the state or growing with consistent moisture produce consistent growth rings that can be depended on for accuracy of estimating age.

Some trees are notorious as being a fence line tree. These trees such as the Hackberry, have fruits which are favorite foods of many wildlife species including birds and mammals. As these animals set on fence and defecate, they assist in planting Hackberry seeds which produce new trees. As time passes and the fence has deteriorates past recognition, the trees such as a straight row of Hackberry trees may also indicate a property line.

Measurements

The standard method for measuring trees is by their diameter at 4.5 feet above the ground. This is referred to as the Diameter at Breast Height (DBH). Often there are multiple trunks or swollen areas or branches that prevent the measurement to be an accurate reflection of the tree's true DBH so there are rules of thumb to follow.

Measure just below any swollen areas or branches. If a tree is leaning then it is measured from the ground along the trunk to 4.5 feet along the trunk. For multi-trunk trees, the largest trunk is measured and added to the sum of the remaining trunks that are measured and divided in half. An example would be if a tree had a 5 inch trunk and 2 – four inch trunks, the diameter would be 9 inch DBH. In San Antonio, we have developed a policy to facilitate measuring multi-trunk trees. For most tree types, when the trunk is measured below the branching the measurement is only 1-2 inches different than if each trunk is measured.

